

# Water Quality



We are pleased to present our **1997 Water Quality Report**. The good news is – your tap water is top quality. This report provides our customers with a summary of where Philadelphia's drinking water comes from, how it is treated to make it safe and healthy, and the results of water quality monitoring performed by us on a daily basis. To meet new federal U.S. Environmental Protection Agency (EPA) requirements for all U.S. water utilities to provide customers with this information, we will be mailing next year's report to all of our customers by May 1999.

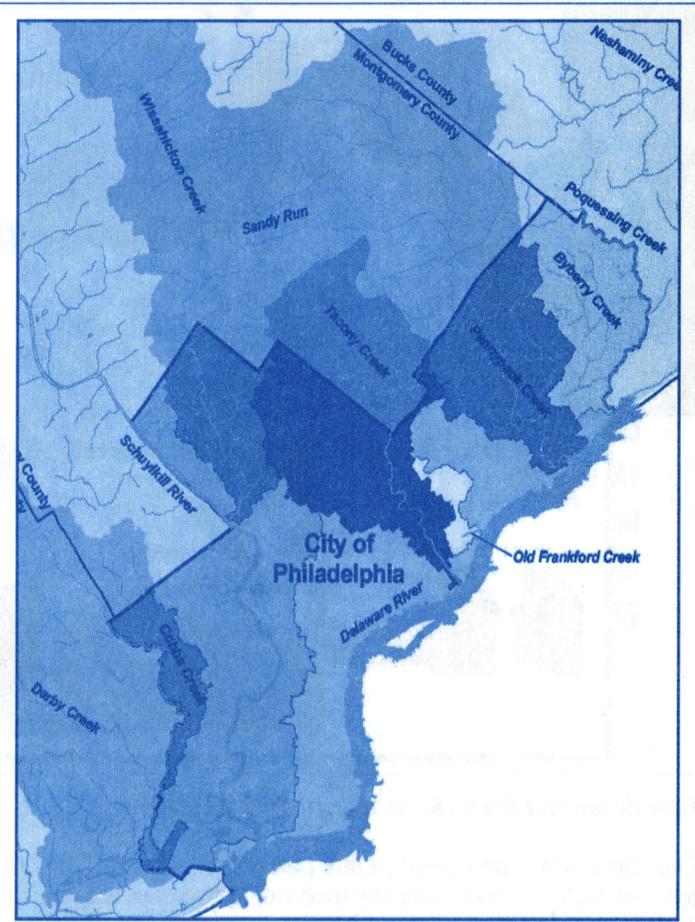
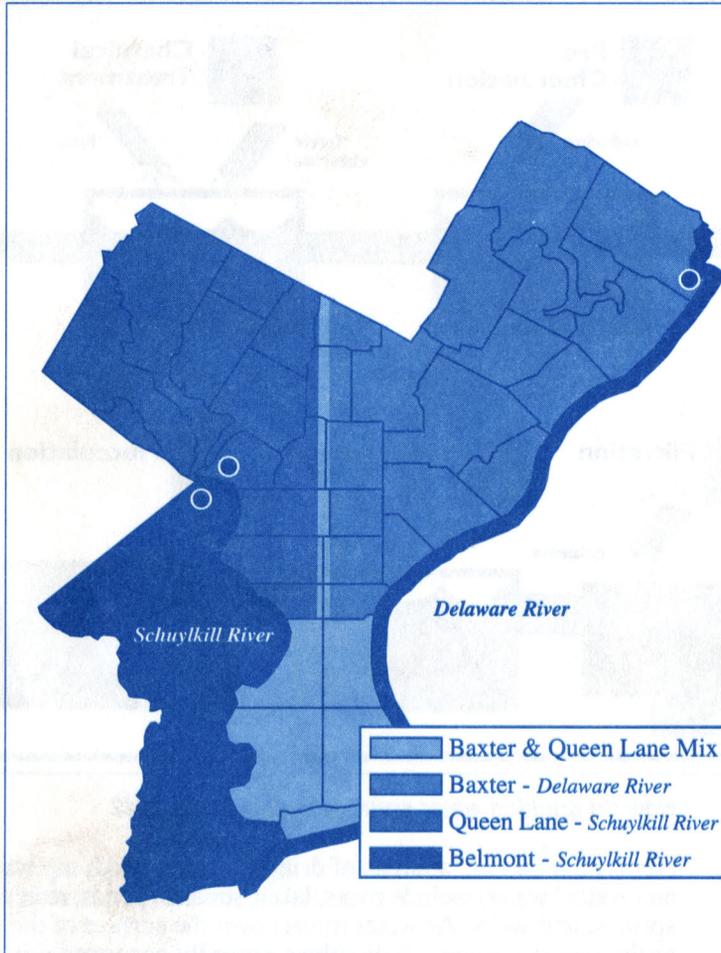
the EPA to protect public health. How do we do this? We are using proven treatment practices at our plants and participating in groundbreaking research while keeping water rates among the lowest in the region. Our goal is to make our customers feel good about drinking the recommended eight glasses of water a day. Let us know if we succeed when you finish reading this report.

*Para recibir una copia de este folleto en español, llame al 685-6300.*

### Where does Philadelphia's drinking water come from?

Philadelphia's water is safe and healthy to drink – and we intend to ensure that it remains that way. We have consistently done better than all drinking water standards developed by

We draw our water for treatment from the Schuylkill and Delaware rivers. Rivers are surface water supplies. Philadelphia does not use groundwater. Each river contributes approximately 50 percent to the City's overall supply. The PWD has three water treatment plants, which process the river water, which is untreated water, to make the water safe and healthy to drink. Approximately 300 million gallons are provided to customers on a daily basis. The map shows you which river and plant services your neighborhood.



**Depending on where you live, you receive drinking water from one of the city's three water treatment plants.**

**PWD's water is drawn from both the Delaware and Schuylkill rivers to provide more than 1.6 million people in Philadelphia and Lower Bucks County with water for drinking, washing, fighting fires, and many other everyday needs.**

## How do we treat the water to make it safe and healthy to drink?

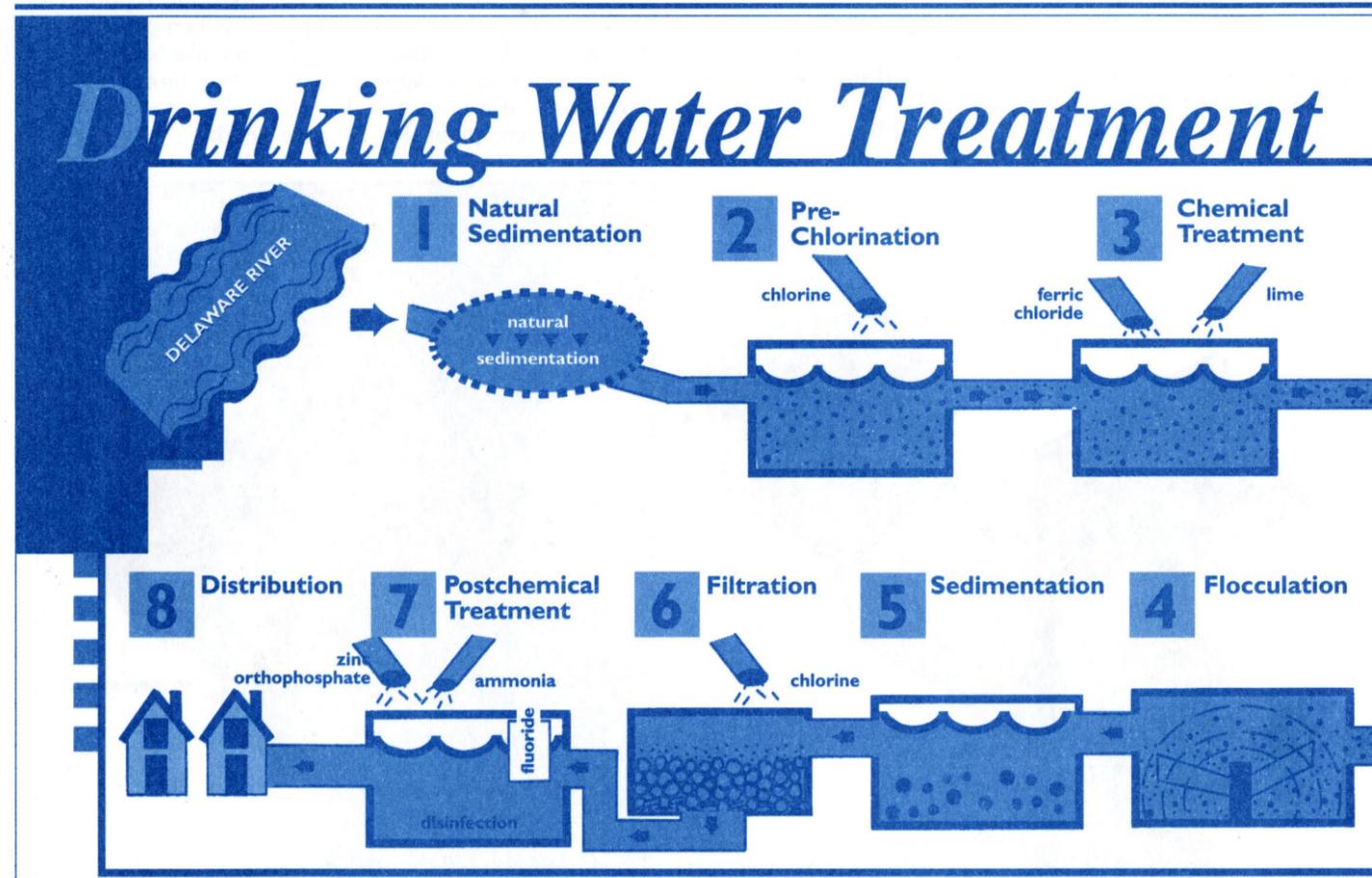
Like the majority of water utilities in the U.S., we use a multi-step treatment process at all three of our water treatment plants. We:

- Store water in reservoirs or basins after it has been pumped from the river to allow river sediments to settle.
- Coagulate the river water (which means causing the smaller particles in the water to join together by adding chemicals which encourage this attraction).
- Mix the water to make sure the added chemicals are well blended and reacting with all of the smaller particles.
- Allow the newly joined particles to settle by gravity and remove the sediment from the bottom of the mixing tanks.
- Filter the water for further purification.

- Add fluoride to help prevent tooth decay.
- Disinfect the water with chlorine to make it safe and healthy.

### Why is chlorine used to disinfect the drinking water?

Disinfection of all public water supplies is required by state and federal law. The EPA and other health agencies recognize that using chlorine is the most effective way to protect public health from disease-causing organisms that can be found in rivers and streams. Because chlorine used by itself can react with natural materials in rivers to chemically form disinfection byproducts such as Trihalomethanes (THMs), we have been adjusting our chlorine process for some time to reduce this chemical reaction. But we also ensure that the treated water that is distributed through the city's water mains to your homes has a "chlorine residual," which continues to protect your water against bacteria and other organisms on its journey to your home tap.



### How do we test the water to assure its high quality?

Our three water treatment plants perform more than 350,000 tests annually to make sure the treatment processes are working as expected. In addition, our scientists, engineers and technicians analyze over 12,000 samples of tap water each year at a sophisticated testing laboratory. This water is collected from reservoirs and more than 70 locations throughout Philadelphia. Each water sample undergoes an average of eight tests to ensure that our customers enjoy safe water, free from contamination.

### How do drinking water sources become polluted?

Across the nation, sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

At their sources, the Delaware and Schuylkill rivers are generally clean rivers. But as the rivers flow downstream, they pick up contaminants from many sources -- stormwater runoff washes pollutants on the land into the rivers, and communities and industries discharge used water back into the rivers. However, we carefully safeguard our urban water supply through a variety of practices and research projects designed to protect our rivers and watershed. For more information about these programs, call 685-6300. For information about the quality of our region's rivers and streams call the PA Department of Environmental Protection (DEP) at 610-832-6000 or check the DEP's website (<http://www.dep.state.pa.us>)

In order to ensure that tap water is safe to drink, the EPA has regulations which limit the amount of certain contaminants in water provided by water suppliers. See charts on pages 4 and 5. The Food and Drug Administration (FDA) establishes limits for contaminants in bottled water which must provide the same level of safety. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (800-426-4791) or EPA's website (<http://www.epa.gov/safewater>).

We also look for over 100 additional contaminants which were not found at reportable levels. These include: arsenic, antimony, beryllium, cyanide, thallium, cadmium, mercury, selenium, benzene, carbon tetrachloride, p-dichlorobenzene, 1,2-dichloroethane, trichloroethylene, 1,1,1-trichloroethane, 1,2,4-trichlorobenzene, 1,1,2-trichloroethane, total xylenes, dichloromethane, chlorobenzene, o-dichlorobenzene, c-1,2-dichloroethylene, t-1,2-dichloroethylene, 1,2-dichloropropane, ethyl benzene, styrene, tetrachloroethylene, toluene, simazine, di(2-ethylhexyl)adipate, endothall, hexachlorocyclopentadiene, oxamyl, pichloram, benzo(a)pyrene, alachlor, atrazine, carbofuran, chlordane, dibromochloropropane, ethylene dibromide, lindane, methoxychlor, and pentachlorophenol.

We also test for aluminum, chloride, color, iron, manganese, silver, pH, sulfate, total dissolved solids, and zinc to ensure that tap water meets all water quality taste and odor guidelines.

The Pennsylvania Department of Environmental Protection (PADEP) has waived requirements to test for the following elements as they are not expected to occur in drinking water in this area: nitrite, asbestos, dalapon, dinoseb, dioxin, diquat, endrin, glyphosate, hexachlorobenzene, 2,4-D, PCBs, toxaphene, 2,4,5-TP, heptachlor, heptachlor epoxide and vinyl chloride. Radon is waived as it is usually associated with groundwater. Radium is done only if other radiological elements exceed an action level.

### Research and Monitoring for Cryptosporidium and Giardia

Cryptosporidium is a microscopic organism that when ingested, can result in diarrhea, fever and other gastrointestinal symptoms. The organism is found in animal wastes and sewage and is washed into rivers and streams when it rains. The best defense against these organisms is an effective water treatment process, most importantly, filtration. We presently produce drinking water that has seven times less turbidity than the national standard. This means that tiny particles smaller than particles visible to the human eye are removed.

We are one of the nation's leaders in Cryptosporidium research and were one of the first utilities in the U.S. to monitor for the organism. Continual research is being performed by us to discover better testing methods, to determine the sources of these parasites in our rivers, and to develop even better treatment practices to further protect our drinking water. In 1997, testing conducted on our treated drinking water resulted in only one sample positive for Giardia and Cryptosporidium. Fifty-one percent of samples taken from the rivers were positive for Giardia and only 11 percent were positive for Cryptosporidium.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium are available from the Safe Drinking Water Hotline (800-426-4791).

### We Welcome Your Ideas and Opinions

We participate in over 200 public/community events a year, including presentations made at schools, ongoing educational programs, summer camps conducted at the Fairmount Water Works Interpretive Center, and our annual open houses and other environmental celebrations. We also offer tours of our facilities and the City's watersheds. We greatly benefit from a number of community advisory committees (CACs) that have been working with us over the last few years to improve our communications with our customers. Citizens representing business and industry, education, environmental advocacy, seniors, regulatory agencies and civic and community groups have assisted us in developing public information about a variety of topics, including drinking water and stormwater pollution prevention. But we would be thrilled to hear from more customers, particularly at this time about the topic at hand - the new **1997 Water Quality Report**.

Before we mail our 1998 version, we would like to get your feedback. So please, fill in the tear-off coupon and mail it back to us, or e-mail us at [waterquality@phila.gov](mailto:waterquality@phila.gov).

## Glossary

### Action Level

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. The action level is not based on one sample, but instead it is based on many samples.

### Maximum Contaminant Level (MCL)

The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

### Maximum Contaminant Level Goal (MCLG)

The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

### ntu

Turbidity is measured with an instrument called a nephelometer. Measurements are given in nephelometric turbidity units.

### picocuries per liter (pCi/L)

A measure of radioactivity in water.

### ppb

One part per billion (1000 times ppm) is equivalent to one penny in \$10,000,000.

### ppm

One part per million is equivalent to one penny in \$10,000.

### Total Haloacetic Acids (THAAs)

A group of chemicals called disinfection-byproducts which form during chlorination. They may be regulated in the future.

### Total Organic Carbon (TOC)

The measure of the carbon content of organic matter. The measure provides an indicator of how much organic material in the water could potentially react with chlorine to form THAAs and TTHMs.

### Total Trihalomethanes (TTHMs)

A group of chemicals called disinfection by-products which form during chlorination. THMs form when natural organic matter in the rivers, e.g., leaves and algae, decompose and combine chemically with the chlorine added for disinfection.

### Treatment Technique

A required process intended to reduce the level of a contaminant in drinking water.

### Turbidity

A measure of the clarity of water related to its particle content. Turbidity serves as an indicator for the effectiveness of the water treatment process. Low turbidity measurements, such as ours, show how we remove particles that cannot be seen by the human eye.

### WTP

Water Treatment Plant

**We are pleased to report our 1997 Water Quality Results. All results are below the maximum recommended levels designed to protect public health. Please see the glossary box for definitions of the abbreviations in the tables.**

#### Metals - Tested at Customers' Taps

	EPA's Action Level for representative sampling of customer homes	Ideal Goal (EPA's MCLG)	90% of PWD's customers' homes were less than	No. of homes considered to have elevated levels	Source
Lead	90% of homes tested less than 15 ppb	0	10 ppb	3 out of 108	Corrosion of household plumbing
Copper	90% of homes tested less than 1.3 ppm	1.3 ppm	0.400 ppm	0	Corrosion of household plumbing

#### Disinfection By-Products in Tap Water

	Highest Level Allowed (EPA MCL) One Year Average	Ideal Goal (EPA's MCLG)	Baxter WTP One Year Average	Queen Lane WTP One Year Average	Belmont WTP One Year Average	Source
Total Trihalomethanes (TTHMs)	100 ppb or less	0	56.5 ppb range of individual test results: 37-82 ppb	48.8 ppb range of individual test results: 20-69 ppb	65.6 ppb range of individual test results: 18-125 ppb	By-product of drinking water chlorination

#### Bacteria in Tap Water

	Level Allowed (EPA MCL)	Ideal Goal (EPA's MCLG)	Highest Monthly Results	Source
Total Coliform Bacteria	Presence of coliform bacteria in 5% or less of over 360 monthly samples	0	Highest % of positive samples: 0.69%	Naturally present in the environment Their presence indicates potential contamination

#### Clarity Characteristics - Tested at Water Treatment Plants

Turbidity (measure of clarity)	Treatment Technique Requirement	Highest Value of Monthly Average For One Year	Source
Baxter WTP	95% of samples must be at or below 0.5 ntu	0.08 ntu	Soil runoff, River sediment
Queen Lane WTP	95% of samples must be at or below 0.5 ntu	0.09 ntu	Soil runoff, River sediment
Belmont WTP	95% of samples must be at or below 0.5 ntu	0.08 ntu	Soil runoff, River sediment

#### Radiological Properties of Tap Water

	Highest Level Allowed (EPA MCL)	Ideal Goal (EPA's MCLG)	Level Detected 1996 (two samples are taken from points in the system every three years)	Source
Man-made (beta) Radiologicals	4 mrem/yr (or > 50pCi/L)	0	2.6 pCi/L	Decay of natural and man-made deposits
Natural (alpha) Radiologicals	15 pCi/L	0	1.7 pCi/L	Erosion of natural deposits

#### Other Chemicals in Tap Water

	Highest Level Allowed (EPA MCL)	Ideal Goal (EPA's MCLG)	Highest Results at a WTP	Range of Test Results for the Year	Source
Fluoride	4 ppm	4 ppm	1.04 ppm at the Belmont WTP	0.93 - 1.04 ppm	Erosion of natural deposits We also add fluoride to our water for dental protection
Nitrate	10 ppm	10 ppm	3.44 ppm at the Queen Lane WTP	1.05 - 3.44 ppm	Runoff from fertilizer use; sewage

#### Synthetic Organic Contaminants (SOCs)/Herbicides/Pesticides (Only one of many Contaminants was Found)

	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result at a WTP	Range	Source
Di(2-ethylhexyl) phthalate	6 ppb	0	0.6 ppb	0 - 0.6 ppb	Discharge from rubber and chemical factories

#### Organic Chemicals for Future Regulation - Tested at Water Treatment Plants

	Average	Range	EPA's Proposed Regulation
THAA	29.7 ppb	24.6 - 38.3 ppb	60 ppb
TOC	2.3 ppm	1.7 - 2.8 ppm	



**Coupon Section to cut out and mail back:**

The PWD's Drinking Water Communications CAC is helping the PWD to develop this Water Quality Report. After we receive your comments, the PWD and the CAC will sit down to review your feedback to determine how to best incorporate your suggestions into the 1998 report. We will be most appreciative if you will take the time to write, or e-mail us with your thoughts!

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number (optional) \_\_\_\_\_

**What are your thoughts about the 1997 Water Quality report? Please rate:**

**Ability to read**

- Easy to read
- For the most part easy to read
- Difficult to read

**Ability to understand**

- Easy to understand
- For the most part easy to understand
- Difficult to understand

**Based on the information contained in this report, how do you feel about your drinking water?**

- Very good
- Good
- Not very good
- Concerned

**Any other comments or items we should include?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Would you be interested in receiving information from us about any of the following?**

- Lead
- Water Conservation
- Water Treatment
- Wastewater Treatment
- Stormwater Pollution Prevention Tips
- EarthMate/Biosolids Composting
- Watersheds
- Cryptosporidium
- Plant Tours

**Mail to:** PWD, ARAMARK Tower, 5th Floor, 1101 Market Street, Phila., PA 19107 c/o the 1997 Water Quality Report or e-mail us at [waterquality@phila.gov](mailto:waterquality@phila.gov). First 100 respondents will receive a complementary water bottle.



Interested citizens are welcome to attend our Drinking Water Quality Communications Citizen Advisory Committee meetings, which take place on the third Tuesday of every month, from 9 a.m. to 11 a.m. at 1101 Market Street, 5th Floor Conference Room, Phila., PA 19107.

**For additional information about this report or PWD services or programs, call 685-6300.**

**The PWD is an active and proud member of:**

- The American Water Works Association*
- The American Water Works Association Research Foundation*
- Partnership for Safe Water*
- Association of Metropolitan Water Agencies*
- Association of Metropolitan Sewerage Agencies*
- Water Environment Federation*
- Water Environment Research Foundation*